4 GLOVE LUBRICANTS

RELEASE AGENTS

Natural rubber latex and some synthetic polymers are tacky, and gloves made of these materials stick to the mold, commonly called a former. Therefore, a mold-release agent or lubricant such as calcium carbonate or a mixture of calcium carbonate and cornstarch is used. A small amount of the release agent remains on the "inside" surface of the glove. In some processes, most of the mold release agent is removed from the surface of the glove by washing or treating with acid.

POWDERED GLOVES

During processing, the “outside” of the gloves are coated with a donning lubricant. In most glove manufacturing processes, gloves are inverted when they are stripped from the formers. For most powdered gloves, the “outside” lubricant is cornstarch which remains, after stripping, inside the inverted gloves as the donning lubricant or powder.

Donning lubricants such as cornstarch, silicone, etc., are used to ease insertion of the user’s hand into a glove. Powdered lubricants are also called donning powders or dusting powders. Cornstarch which meets the specification for absorbable donning or dusting powder in the United States Pharmacopeia (U.S.P.) is a commonly used lubricant for patient examination gloves.

Powder used for lubricating examination gloves should meet the U.S.P. monograph for absorbable dusting powder or be shown to be equivalent in terms of safety and effectiveness. The *U.S.P. NF XVII Monograph for Absorbable Dusting Powder* is presented near the end of this chapter. The 510(k) submission must state the type, specifications and source of powder or other donning lubricant used on the gloves. Talc, cotton flock, and other non-absorbable materials are **not** acceptable as a lubricating, dusting or donning powder. Lycopodium (club moss spores) and ground pine pollen are toxic and are not acceptable as powder on or in medical gloves. Also, the ASTM standards require that the inside and outside surface of medical gloves be free of talc (paragraph 4.3 of D 3578-91 and D 5250-92, and paragraph 5.3 of D 3577). The ASTM standard for finger cots (paragraph 5.3, D 3772) requires that cots

and any dressing materials applied to them not liberate substances known to be toxic or otherwise harmful under normal conditions of use.

Absorbable dusting powder **for lubricating a surgeon's glove** is a transitional device (a device formerly regulated as a new drug before l976) and is listed under 21 CFR 878.4480 as a Class III device which requires an approved Premarket Approval Application (PMA) or prior to May 28, l976, a New Drug Application (NDA). Only absorbable dusting powders from powder manufacturers that have an approved PMA or NDA may be used on powdered surgeon's gloves.

A small amount of silicone or other lubricant is used on some powder-free gloves to aid in donning. If used, such lubricants should be on the finished gloves when biocompatibility tests are conducted. The exact composition of the lubricant should be identified in the 510(k) submission.

Powder from medical gloves directly contacts wounds, body cavities and skin, and it contaminates the user environment. Due to the enormous numbers of medical gloves used in healthcare, the amount of powder on finished gloves needs to be minimized. To meet QS requirements for device specifications in §§820.30 and 820.181, manufacturers should establish a specification for the amount of powder on a glove. (Also see the labeling information in chapter 6 regarding the powder level on gloves.) The manufacturer should also establish a procedure to verify that the powder level on the finished gloves meet their specification.

CONTENT AND FORMAT OF PMAS FOR ABSORBABLE DUSTING POWDER FOR SURGICAL GLOVES

Prior to the passage of the Medical Device Amendments to the Food, Drug and Cosmetic Act (FD&C Act) on May 28, 1976, absorbable dusting powder for surgical gloves was regulated as a drug and required an approved New Drug Application (NDA) before it could be marketed in the United States (Federal Register, May 25, 1971). Therefore, under the Medical Device Amendments to the FD&C Act, such dusting powder was automatically classified as a Class III, transitional device. The final classification for this device was published in the Federal Register, June 24, 1988, Vol. 53, No. 122, page 23875, and listed in 21 CFR 878.4480. In this final ruling, absorbable powder for lubricating a surgical glove is defined as a powder made from corn starch that meets the specifications for absorbable powder in the United States Pharmacopeia (U.S.P.) and that is intended to be used to lubricate the hand in order to ease the donning of surgical gloves. The device is absorbable through biological degradation. Since this final ruling has placed this device in Class III, all new dusting powder for use with surgical gloves must be approved for marketing by the PMA process (21 CFR 814).

The Infection Control Devices Branch may be consulted prior to the initiation of any tests or during the preparation of an application for absorbable dusting powder for surgical gloves to discuss protocols and data requirements.

A. Editorial Considerations

The PMA submission should be carefully edited and scientifically reviewed before it is submitted to FDA. It should be proofread to assure that all pages are properly indicated, consecutive, distinctly copied, and readable. A well written, organized, and paginated submission will accelerate the review process.

B. Abbreviations

Standard abbreviations acceptable to a significant peer reviewed journal should be used wherever possible. All other abbreviations should be identified at the beginning of each section in which they are used or in footnotes to tables and graphs.

C. Data Availability

This guidance document outlines typical circumstances of data review. It is not possible to anticipate all situations that may require further FDA analyses. Thus, submitters should be aware that they may be asked by FDA to submit additional data, to present data in another format, or to provide more detailed explanations of the information submitted.

Applicants should retain data used for the PMA submission in a controlled and well organized format. This will allow the firm to provide FDA expeditiously with additional information or analysis if required. Errors in data that are identified by the applicant after submission to FDA should be brought to FDA's attention immediately.

D. Tables and Graphs

Well-constructed tables and graphs are fundamental to the reporting and evaluation of data. All tables and graphs should have titles which clearly identify the nature of the data, and all symbols should be captioned and keyed to a footnote or accessible reference page which clearly explains the nature of the symbols.

Graphs should supplement, not replace, data tables. Tables and graphs should be of a quality acceptable to a significant peer reviewed scientific journal.

E. Published Literature

Published methods or data referenced in study reports should be appended to the study report. Reprints of other referenced published reports or data should be appended to the section in which they are referenced. All referenced reports and data should be summarized and an explanation of how this information relates to the current submission should be provided.

F. Protocols and Data Analysis

1. Test reports must include the protocol (objectives, precise description of materials,

experimental methods, controls), observations, statistical analyses, conclusions and comments. Additional specific directions on protocols are addressed in other sections of this guidance document.

2. Analytical methods must be clearly described and conform to recognized analytical and statistical methods.

G. Physical and Chemical Information

1. Manufacturing (21 CFR 814.20(b)(4)(v))

   The sponsor should submit a complete description of the methods, facilities, and controls used in the manufacture, processing, packing, and storage of the device. The description should contain sufficient detail so that a person generally familiar with good manufacturing practices can make a knowledgeable judgement about the quality control used in the manufacturing of the device. This information should begin with the origin of the raw material and should detail all manufacturing processes through the distribution of the finished product. The source of and technical information for each reagent used in the preparation and processing of the powder should be provided. Pass/fail criteria for each major processing step should be given. For a cross-linked starch, a complete description of the cross-linking process should be provided.

   Manufacturing should be in compliance with current good manufacturing practices. Manufacturing guidance is available in the document titled "Guidance for the Preparation of PMA Manufacturing Information" available upon request from the Division of Small Manufacturers Assistance (DSMA).

2. Device Description (21 CFR 814.20(b)(3)(ii))

   The sponsor should provide a complete and detailed description of the physical and chemical properties and specifications of the absorbable dusting powder.

   The physical characterization should include data such as the color, size, and distribution of the powder particles. The chemical characterization should include the chemical composition of the powder and the chemical name, molecular formula, and quantity of each constituent.

   The manufacturing specifications of the physical and chemical aspects of the powder should be fully defined. The specifications for an absorbable dusting powder should include aspects such as those described in U.S.P. for corn starch-based absorbable dusting powder. In addition, the extent to which the starch is modified in the final product should be specified. For example, the specifications for the upper and lower limits for the degree of cross-linking should be provided for a starch that has been modified by chemical cross-linking.

3. Sterilization Information

The sponsor should identify the types of sterilization processes that are compatible with the absorbable dusting powder, and the appropriate cycle parameters and conditions to be used with each method should be noted. Data should be provided demonstrating that the absorbable dusting powder is unchanged following sterilization by each method and still meets the physical and chemical specifications of the powder. In addition, the sponsor should provide information on the bioburden of the powder and on the ability of the product packaging to maintain a low bioburden in the powder during storage (shelf life stability).

4. Physical and Chemical Testing

Physical and chemical testing should be conducted to confirm that the manufacturing specifications are met. This information should include the methods and results of tests conducted to ensure that the product meets the specifications for the final product. For a corn starch-based dusting powder, the product must meet the identification found in the Federal Register, May 25, 1971 and U.S.P. specifications for Absorbable Dusting Powder. (A copy of the U.S.P. specifications is attached.) In addition, certification that the powder meets U.S.P. specifications should be provided.

Methods for monitoring the extent of the modification in the powder for compliance with the specification during the manufacturing process should be described. If the parameter cannot be measured using a direct method, an alternative method and test data should be provided which correlate the specified parameter with the indirect test method.

H. Nonclinical Studies

All testing should be conducted using samples of the finished powder sterilized by each method specified in the labeling (i.e., steam, ethylene oxide, and radiation).

1. Toxicological Studies

To ensure the safe use of absorbable dusting powder, a toxicological evaluation of the powder additives and all residues remaining associated with the powder should be submitted. This information will assist FDA in evaluating the potential health risks to patients and users that are presented by the presence of the residues.

Residues of all of the agents added to the powder during the manufacturing process should be considered. The residues that are of concern should be identified and justification should be provided for excluding any residues. Evidence then should be provided showing that the amount of each residue of concern remaining associated with the powder is at a safe level. The evaluation may be accomplished on the toxicity of the powder additives and/or any remaining toxic residues by reviewing the available information from the following sources:

a. animal toxicity studies sponsored by the manufacturers of the cross-linking agents and additives; and

b. animal toxicity studies in the published scientific literature.

Copies of all references should be provided.

If inadequate information is available from the manufacturers or the published literature, then toxicity testing for the absorbable dusting powder itself should be conducted. Because the dusting powder is considered a skin contact device, the appropriate toxicological tests for absorbable dusting powder should include:

a. Skin irritation tests
b. Skin sensitization assay

Other tests may also be deemed necessary. The applicant should refer to the ISO 10993, Part 1, "Biological Evaluation of Medical Devices"[1] for further details on biocompatibility testing of medical devices. For conducting these tests, published guidelines and methods should be referenced and a complete description of the test methods should be provided.

2. Bioabsorbability Studies

The sponsor should establish that any modification, such as cross-linking, made to the natural starch does not significantly alter the biodegradability of the starch. The need for bioabsorbability data may be addressed with in vitro testing of the modified powder for susceptibility to the digestive enzyme, amylase. The rate of enzymatic degradation of the modified starch powder, unmodified starch, and talc as a negative control (resistant to degradation) by amylase should be compared. If the difference in the rate of degradation between the modified and unmodified starch is insignificant, then we may assume that the biodegradability of the modified powder produced by the new process is comparable to that of unmodified starch. Such a result would suggest that the risk of formation of granulomas or a foreign body reaction is no greater for the modified starch than for the unmodified starch.

If the above described biodegradability data are **inadequate** to resolve concerns about the safety of the powder, then in vivo animal bioabsorbability testing should be conducted.

The applicant should refer to published literature for information about the appropriate test methods. A complete description of the in vitro and/or in vivo test methods should be provided. The applicant may provide a test protocol to the FDA for review prior to initiation of the tests. Although review of the protocol provides the applicant with comments and suggestions regarding the test method, it does not ensure that the final test protocol will be adequate.

I. Clinical Studies

It is not expected that clinical studies will be necessary to support the safety and effectiveness of absorbable dusting powder in a PMA.

J. Labeling (21 CFR 814.20(b)(10))

The methods of sterilization that are compatible with the absorbable dusting powder and the cycle parameters and conditions for each method should be stated.

K. Environmental Assessment (21 CFR 814.20(b)(11))

The sponsor may claim a categorical exclusion from the requirement of an environmental assessment but must provide information to justify the exclusion.

L. References

Use of International Standard ISO-10993, "Required Biocompatibility Training and Toxicology Profiles for Evaluation of Medical Devices" (G95-1).
http://www.fda.gov/cdrh/g951.html

M. Contacts and Addresses

Further information concerning the PMA regulations and/or PMA requirements can be obtained at: http://www.fda.gov/cdrh/pmapage.html

General questions regarding the submission of premarket approval applications or requests for guidance documents should be directed to the Division of Small Manufacturers Assistance (DSMA), HFZ-220, CDRH, FDA, 1350 Piccard Drive, Rockville, Maryland 20850; phone (800) 638-2041 and FAX (301) 443-8818.

Specific questions regarding Premarket Approval Applications for medical glove dusting powders should be directed to the following address.

Chief, Infection Control Devices Branch (HFZ-420)
Food and Drug Administration
Center for Devices and Radiological Health
Office of Device Evaluation
Division of Dental, Infection Control and General Hospital Devices (DDIGD)
9200 Corporate Blvd.
Rockville, MD 20850

Phone: (301) 443-8913
FAX: (301) 480-3002

ABSORBABLE DUSTING POWDER, USP

Absorbable Dusting Powder is a specially processed cornstarch. It is a substance recognized in the United States Pharmacopeia - National Formulary (USP-NF). The USP-NF is a standards setting body in the United States. The USP-NF is officially recognized in the Federal Food, Drug and Cosmetic Act (Act).

Under section 502(g) of the Act, if a product is claimed to be the same as one named in an official compendium, including the USP-NF, it must be packaged and labeled in accordance with the requirements stated in the compendium. Failure to meet this requirement causes the product to be misbranded.

Therefore, if you choose to use Absorbable Dusting Powder, USP as a donning powder or glove lubricant, the powder you use must meet the requirements stated in the current revision of the USP-NF. You can get information about obtaining a copy of the current monograph for Absorbable Dusting Powder, USP from the USP Internet web site at: http://www.usp.org/

STERILIZATION OF POWDERED GLOVES:

In addition, validation data, such as the Sterility Assurance Level (SAL) and the organism used as a biological indicator, should be provided, and the validation method for each sterilization process should be described. Since powder is sold nonsterile and is sterilized with gloves by glove manufacturer, then it is the responsibility of the glove manufacturer to validate the sterilization method.

Since surgical gloves may be labeled for resterilization if the package integrity is breached, data on the number of sterilization cycles that the powder can withstand and still remain within specifications should be provided. This is not needed since gloves should be discarded and not resterilized if the package integrity is compromised.

If sterilization with ethylene oxide is specified, then the maximum levels of residues of ethylene oxide, ethylene chlorohydrin, and ethylene glycol which may remain associated with the powder should be provided. The levels should be consistent with the draft Federal Register Notice on ethylene oxide limits. This is not needed since this is the responsibility of the glove manufacturer with the final product.

FIRMS WITH NDA or PMA for U.S.P. ABSORBABLE DUSTING POWDER

(These are companies that have approvals as of February, 1998. This list will be updated as future applications are approved and this manual is reprinted.)

COMPANY	NUMBER	TRADE NAME
Roquette America 1417 Exchange Pl. Keokuk, Iowa 52632 FAX 908-685-5005	N83023 N85356	KEOFLO 7136 KEOFLO 7136p
National Starch and Chem. P.O. Box 6500 10 Finderne Ave Bridgewater, New Jersey 08807-0500 FAX 908-685-5005	N80535	ABSORBO - cross linked with oxychloride. ABSORBO-HP-cross linked with epichlorohydrate
Grain Processing Corp. 1600 Oregon Street Muscatine, Iowa 52761 FAX 319-264-4495	P890070	PURE-DENT b851
Agrana Starkegesellschaft m.b.H. Conrathstrabe 7 A-3953 GMUEND AUSTRIA FAX 43 2852 503 360, 361	P880089	AGENASORB 9020
A.E. Staley Manufacturing Route #4 P.O. Box 55 Houlton, ME 04730 FAX 207-532-2572	P900016	MIR-FLO Starch

FEDERAL REGISTER, VOL. 36, NO. 101 - TUESDAY, MAY 25, 1971

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Food and Drug Administration
[DESI 6264]
ABSORBABLE DUSTING POWDER
Drugs for Human Use; Drug Efficacy Study Implementation

The Food and Drug Administration has evaluated a report received from the National Academy of Sciences - National Research Council, Drug Efficacy Study Group, on the following drug for use as a glove dusting powder:

Bio-Sorb: nonpeptizable homogeneous mixture of amylose and amylopectine derived from cornstarch with 2 percent magnesium oxide, marketed by Ethicon, Inc., Division of Johnson and Johnson, U.S. Highway 22, Somerville, New Jersey 08876 (NDA 6-264).

Such drugs and similar drugs are regarded as new drugs [21 U.S.C. 321(p)]. Supplemental new drug applications are required to revise the labeling in and to update previously approved applications providing for such drugs. A new drug application is required from any person marketing such drug without approval.

A. *Effectiveness classification*. The Food and Drug Administration has considered the Academy report, as well as other available evidence, and concludes that a nonpeptizable homogeneous mixture of amylose and amylopectine derived from cornstarch with 2 percent magnesium oxide is effective for use as a biologically absorbable glove powder.

B. *Conditions for approval and marketing*. The Food and Drug Administration is prepared to approve abbreviated new drug applications and abbreviated supplements to previously approved new drug applications under conditions described herein.

1. *Form of drug*. The drug is in sterile powder form suitable for dusting of surgical gloves.

2. *Labeling conditions*.

a. The label and other labeling bear the statements:

(1) “Caution: Powder should be removed from the gloves after donning by wiping gloves thoroughly with a sterile wet sponge, sterile wet towel, or other effective method.”

(2) Surgical gloves treated with this powder are required to be labeled with the statement: "Caution: After donning, remove powder by wiping gloves thoroughly with a sterile wet sponge, sterile wet towel, or other effective method."

b. The package labeling includes appropriate material which is recommended for display

at the point of use and is designed to convey the above cautions to users of the drug or gloves treated with the drug.

c. The drug is labeled to comply with all requirements of the Act and regulations. Its labeling bears adequate information for safe and effective use of the drug. The recommended use of the drug as stated on the label and in any other labeling is as follows: "A biologically absorbable glove powder."

3. *Marketing status.* Marketing of such drugs may be continued under the conditions described in the notice entitled "Conditions for Marketing New Drugs Evaluated in Drug Efficacy Study" published in the FEDERAL REGISTER July 14, 1970 (35 F.R. 11273), as follows:

a. For holders of "deemed approved" new drug applications (i.e., an application which became effective on the basis of safety prior to October 10, 1962), the submission of a supplement for revised labeling and an abbreviated supplement for updating information as described in paragraph (n)(1) (i) and (iii) of the notice of July 14, 1970.

b. For any person who does not hold an approved or effective new drug application, the submission of an abbreviated new drug application as described in paragraph (a)(3)(i) of that notice.

c. For any distributor of the drug, the use of labeling in accord with this announcement for any such drug shipped within the jurisdiction of the Act as described in paragraph (b) of the notice.

A copy of the NAS-NRC report has been furnished to the firm referred to above.
(the report si now out of print)

Communications forwarded in response to this announcement should be identified with the reference number DESI 6264, directed to the attention of the appropriate office listed below and addressed to the Food and Drug Administration, 5600 Fishers Lane, Rockville, Maryland 20857:

Supplements (identify with NDA number):
Office of Scientific Evaluation (BD 100), Bureau of Drugs.
Original abbreviated new drug applications (identify as such):
Drug Efficacy Study Implementation Project Office (BD-5), Bureau of Drugs.
All other communications regarding this announcement:
Drug Efficacy Study Implementation, Project Office (BD-5), Bureau of Drugs.

This notice is issued pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (Secs. 502, 505, 52 Stat. 1050-53 as amended: 21 U.S.C. 352, 355) and under the authority delegated to the Commissioner of Food and Drugs (21 CFR 2.120).

Dated: May 10, 1971

SAM D. FINE
Associate Commissioner
for Compliance

[FR Dec. 71 7218 Filed 5-21-71:8:46 am]